The large-format lens with perfect sharpness for macro shots

Modern standard lenses for large formats are optimized for medium to far taking distances and for reproduction scales of around 1:3 to 1: ∞. However, in many areas of studio photography, it is necessary to photograph small objects practically in their natural size or even slightly larger. Examples include packaging, cosmetics, watches and jewelry. The 6-element Rodenstock Apo-Macro-Sironar lens type has been created especially for such photos at larger scales where even the best standard lenses for large formats begin to show a loss in quality.

Optimized for flexible application from 1:5 to 2:1 with wide image angle for camera movements

The Rodenstock Apo-Macro-Sironar optimized for the scale of 1:2 (half life-size) ensures excellent image reproduction properties within a practical range of 1:5 to 2:1 without requiring any additional adjustment for scale. As a result, practically all shots in "table-top" photography can be taken: for a film size of 9×12 cm (4×5"), the scale range of 1:5 to 2:1 allows a format-filling taken object field of around 50×60 cm to around 5×6 cm and for the size 6×7 cm, an object field of around 28×34 cm to just under 3×3.5 cm. The overlapping of this scale range with that of the "standard" Apo-Sironar lenses avoids the need to change lenses too frequently in borderline areas.

Because large-format photography is characterized not only by its superior focus, but also and above all by its mastery of perspective, the Apo-Macro-Sironar has been designed to provide the large image angle this requires. The resulting large image circle diameter creates the best conditions for the parallel camera movements required to avoid converging lines.

The main difference to the Rodenstock Apo-Ronar, which excels equally in the near and macro ranges, can be found in the larger image angle and the resulting available movement reserves. Another advantage of the Apo-Macro-Sironar is the maximum aperture of f/5.6 (one stop higher than the Apo-Ronar) which ensures a brighter, brilliant and precisely focusable screen image. In the macro range, this is of special advantage as the depth of field is lower here and the large extension length produces a noticeable loss in light (of two stops at 1:1).

High apochromatic correction for the most stringent demands on imaging quality

The 6-element Rodenstock Apo-Macro-Sironar is characterized by high contrast right up to the image circle margin over the whole recommended scale range. It offers perfect focus from a working aperture of only 16. Its apochromatic correction ensures that even extremely high-contrast edges are reproduced without any color fringes.

The distortion which is especially irritating on technical motifs and reproductions is so low that it can no longer be perceived. As a result, the Apo-Macro-Sironar can be considered as practically

Apo-Macro-Sironar 120 f/5.6 mm in a Copal 0 shutter

free from distortion and can be used without any concern in this regard when taking critical technical shots.

This means that the Apo-Macro-Sironar meets the same high quality demands in the near and macro ranges as the recognized high-performance lenses Apo-Sironar-N and Apo-Sironar-S at the smaller scales usual in normal studio and outdoor shots.

Two ideal focal lengths for close-up work

To cover a wide range of sizes, the Apo-Macro-Sironar is available in two focal lengths: the Apo-Macro-Sironar 120 mm f/5.6 is designed for sizes up to 9×12 cm (4×5") and can also be recommended for digital shots down to a size of 3×3 cm.
On the other hand, the Apo-Macro-Sironar 180 mm f/5.6 still provides large movement reserves at 13×18 cm (5×7") and – depending on the scale – can even be used with limited movement for 18×24 cm (8×10") (see the bottom chart on the next page for a size overview and movements).

In both cases, the focal length is long enough to allow a sufficiently large working distance to compose and illuminate the motif design without any hindrance. On the other hand, it is short enough to permit scales of up to 2:1 with most cameras without any additional rail extensions. Particularly the Apo-Macro-Sironar 120 mm f/5.6 is therefore also eminently suitable for baseboard cameras.

Apo-Macro-Sironar 180 f/5.6 mm in a Copal 1 shutter

In addition, these focal lengths generate a very natural perspective in the recommended close-up taking formats: depending on the scale, 120 mm in close-up appears like 150 to 210 mm at an intermediate distance thanks to the larger extension length while focal length 180 mm at close-up corresponds to around 210 to 300 mm at medium distances.

Another benefit of the relatively short extension lengths is the increased stability of the camera with less vibration sensitivity. The larger image angle also helps reduce wobble (wide-angle lenses are known to permit longer shutter times than zoom lenses when taking free-hand shots even when the scale is the same).

Also eminently suitable for digital photography thanks to the excellent imaging quality

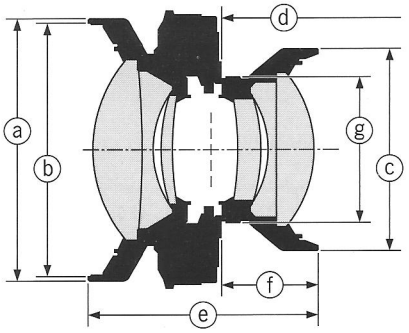
Particularly the Apo-Macro-Sironar 120 mm f/5.6 is also an ideal near and macro lens for digital shots: first, it offers a very high resolving power and – within an image circle reduced to around a diameter of 180 mm – excellent contrast from f/number 11 (the vignetting still visible at f/number 11 only becomes effective outside this reduced image circle and is therefore negligible). As the chip sizes and the CCD array lengths are comparatively small, even this reduced image circle still allows enormous movements.

Second, an optimum working f/number of 11 is particularly advantageous for scanner cameras because these require constant light rather than a flash. But the metallogen discharge lamps (HMI, MSR) required for high luminance are very expensive so that such a large working f/number noticeably reduces the costs for the lamp park.

Formats, shutters and lens dimensions

Apo-Macro-Sironar	Recommended maximum film size	Shutter size	Smallest aperture with shutter: Copal	Prontor Prof.	Electronic*	Push-on mount diameter	Filter thread	Rear lens barrel diameter	Flange focal distance at 1:∞	Overall length	Contact area to rear edge	Shutter thread
						a	b	c	d	e	f	g
120 mm f/5.6	9×12 cm / 4×5"	0 01 S	64 –	– 45		51 mm	M 49×0.75	40.5 mm	236 mm 234 mm	43.8 mm	16.1 mm	M32.5×0.5 M 39×0.75
180 mm f/5.6	13×18 cm / 5×7"	1 / 1S	64	64		70 mm	M 67×0.75	54.0 mm	176 mm	61.2 mm	25.5 mm	M 39×0.75

Further shutter versions on request. *Electronic shutter in preparation



Optical design: 6 elements in 4 groups

Notes on the recommended working aperture

In the following chart, the range given for the recommended working aperture is that in which the highest sharpness is achieved over the whole image field with the depth of field being neglected.

The larger aperture applies to the unmoved lens, i.e. when the "format range" is used. The smaller aperture applies to camera movements where the format reaches to the image circle margin, that is when the "movement range" is utilized. A corresponding intermediate value is recommended for lower shifts or tilts of the lens.

Depending on the reproduction ratio and the depth of the motif, the depth of field may require further stopping down. In this case, the sharpness may be reduced due to diffraction, particularly in the center of the image circle.

Working aperture, image angle, image circles and movements

Apo-Macro-Sironar	Scale	Recom. working aperture	Image angle and image circle diameter at f/22	Movements in mm for landscape and f/22 (for portrait the values should be inverted): 3×3 cm	4.5×6 cm	6×6 cm	6×7 cm	6×9 cm	6×12 cm	9×12 cm	4×5"	
120 mm f/5.6	1:5	8 - 11	70°/ 201 mm	↑85 →85	↑76 →71	↑69 →69	↑67 →63	↑64 →56	↑55 →35	↑42 →35	↑33 →29	
	1:1	8 - 11	60°/ 277 mm	↑123 →123	↑115 →109	↑108 →108	↑106 →101	↑104 →95	↑98 →79	↑85 →75	↑77 →70	
	2:1	8 - 11	55°/ 374 mm	↑172 →172	↑164 →158	↑157 →157	↑156 →151	↑155 →145	↑150 →128	↑137 →126	↑129 →121	

				6×7 cm	6×9 cm	6×12 cm	9×12 cm	4×5"	13×18 cm	5×7"	18×24 cm	8×10"
180 mm f/5.6	1:5	16 - 22	70°/ 302 mm	↑119 →114	↑116 →104	↑112 →91	↑98 →88	↑90 →83	↑63 →52	↑64 →53	↑11 →9	
	1:1	16 - 22	60°/ 415 mm	↑177 →171	↑174 →161	↑171 →148	↑158 →146	↑150 →142	↑128 →113	↑129 →113	↑87 →73	↑70 →61
	2:1	16 - 22	55°/ 562 mm	↑250 →245	↑249 →235	↑247 →222	↑233 →220	↑226 →216	↑206 →188	↑207 →189	↑170 →152	↑155 →141

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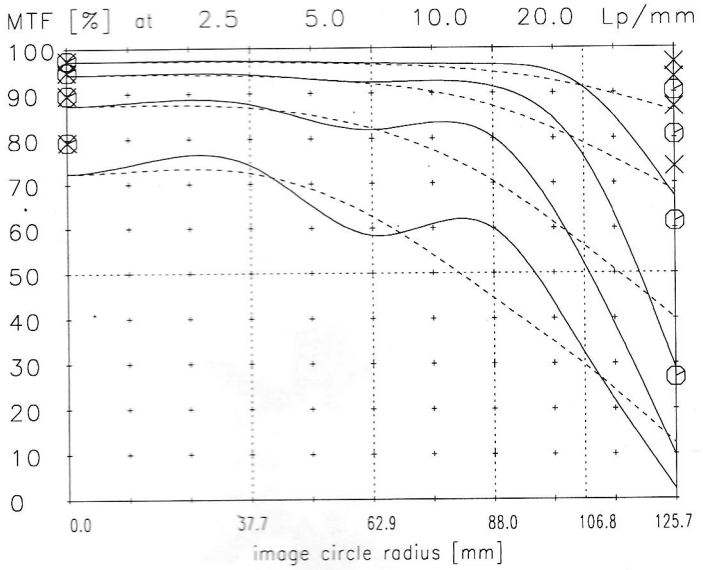
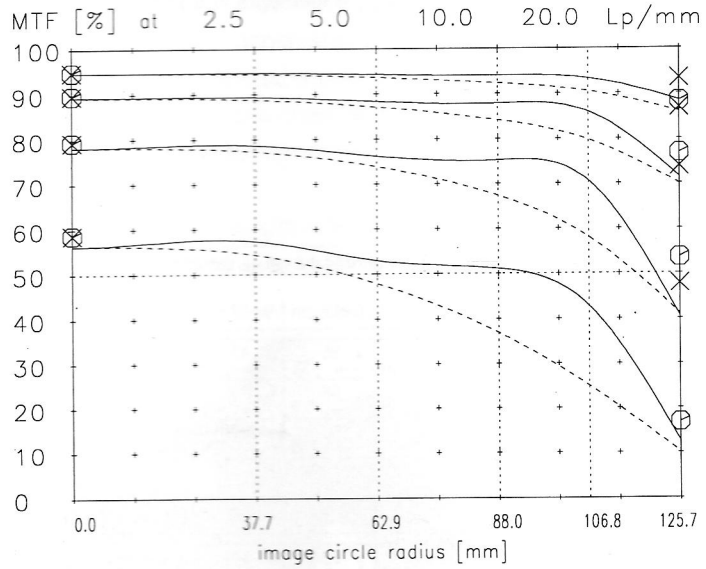
Apo-Macro-Sironar 120 mm f/5.6

MTF at ratio 0.5x f/ 11



MTF at ratio 0.5x f/ 22

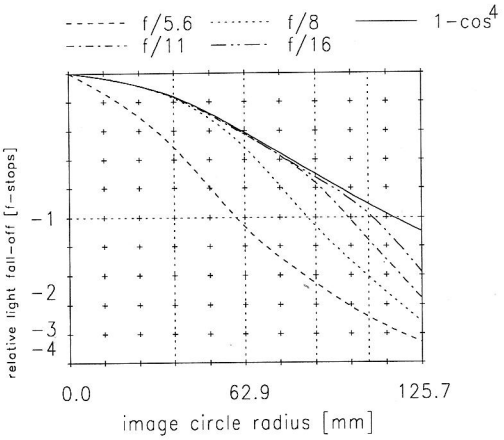


sagittal, × Diffraction limited value

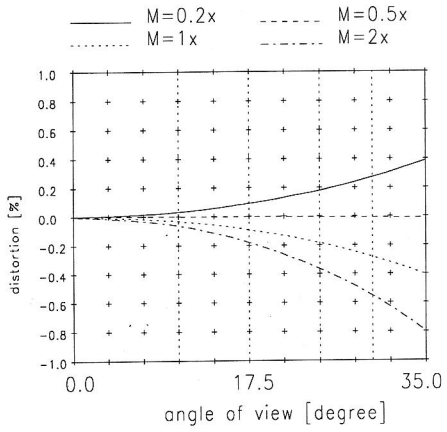
meridional, ⊖ Diffraction limited value

Named frequencies [line pairs/mm] in modular transfer function (MTF) as well as diagrams of relative light fall-off, distortion and longitudinal color aberration refer to film plane.

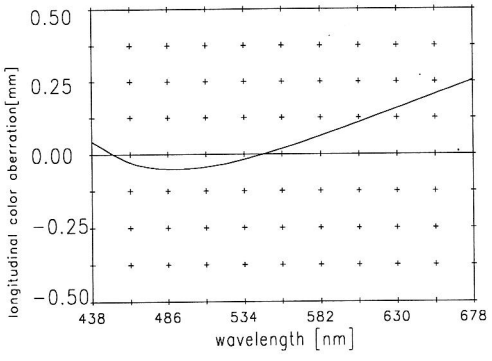
relative light fall-off at ratio 0.5x



Distortion at ratio 0.2x to 2x



Longitudinal color aberration at ratio 0.5x



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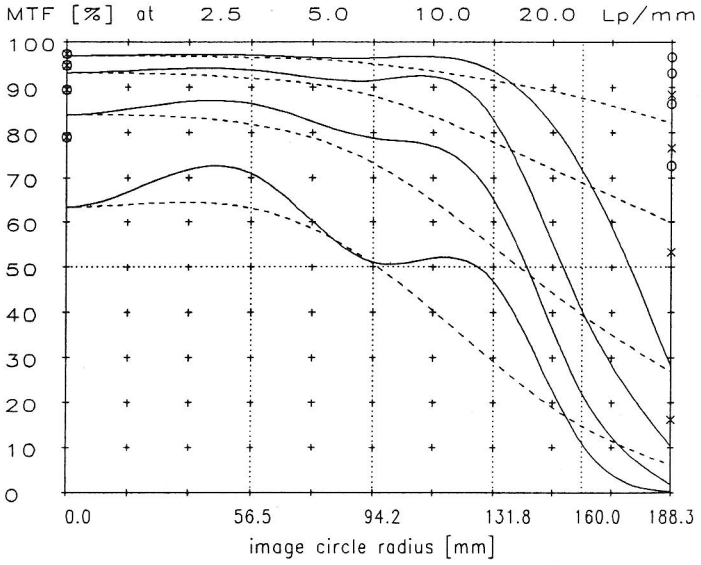
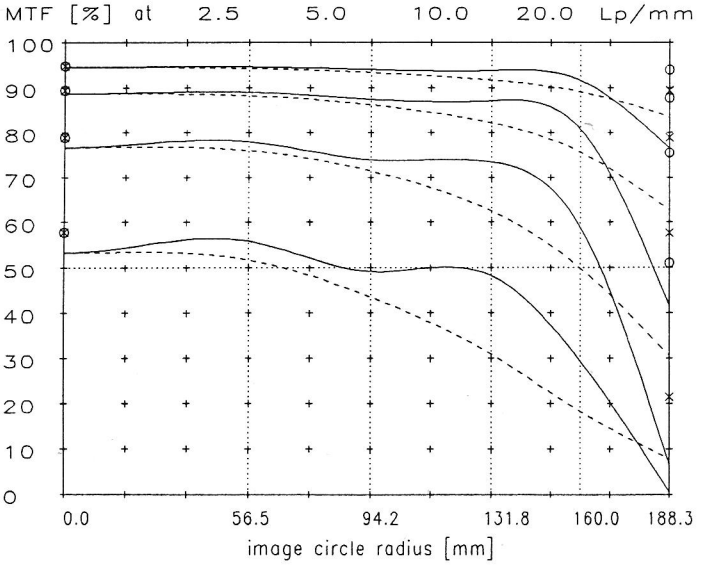
Apo-Macro-Sironar 180 mm f/5.6

MTF at ratio 0.5x f/11



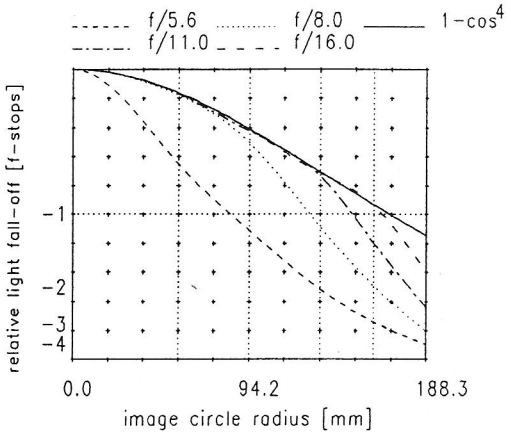
MTF at ratio 0.5x f/22



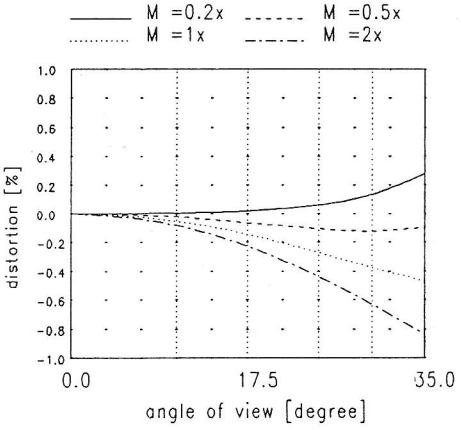
——— sagittal, o Diffraction limited value
------ meridional, × Diffraction limited value

Named frequencies [line pairs/mm] in modular transfer function ((MTF) as well as diagrams of relative light fall-off, distortion and longitudinal color aberation refer to film plane.

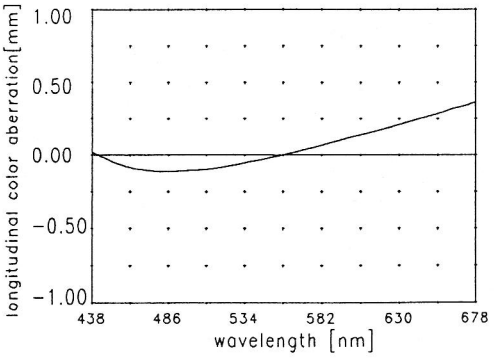
relative light fall-off at ratio 0.5x



Distortion at ratio 0.2x to2x



Longitudinal color aberration at ratio 0.5x



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